WHAT IS CLAIMED IS:

1. An optical pickup apparatus comprising:

a first laser source which emits a first beam;

a second laser source which emits a second beam having a polarization plane substantially perpendicular to a polarization plane of the first beam;

a polarization diffraction element which selectively diffracts one of the first beam and the second beam in accordance with polarized states thereof; and

an objective lens which records or reproduces information by focusing the first beam which has passed through said polarization diffraction element onto an information recording surface of a first optical information recording medium, and records or reproduces information by focusing the second beam which has passed through said polarization diffraction element onto an information recording surface of a second optical information recording medium.

2. The apparatus of claim 1,

wherein said first laser source and said second laser source emit beams having different wavelengths,

wherein said objective lens includes including a refraction lens, which has a positive power, and a diffraction lens structure, which has a plurality of rings with fine stepped portions formed on at least one of lens surfaces of the refraction lens, and

wherein diffraction order in the diffraction lens

structure at which a highest diffraction efficiency is obtained with respect to a beam having a shorter wavelength is different from a diffraction order at which a highest diffraction efficiency is obtained with respect to a beam having a longer wavelength, and

said polarization diffraction element generates diffracted light which exhibits a highest diffraction efficiency at a predetermined diffraction order other than 0 when one of the first beam and the second beam is incident in a predetermined polarized state.

3. The apparatus of claim 2, wherein said polarization diffraction element generates diffracted light with a diffraction efficiency of not less than 85% with respect to one of two incident light beams having orthogonal polarization planes.

4. The apparatus of claim 2, wherein letting $\lambda 1$ be a wavelength of the first beam, m1 be a diffraction order at which a highest diffraction efficiency is obtained when the first beam passes through the diffraction lens structure, ë2 ($\lambda 2 > \lambda 1$) be a wavelength of the second beam, and m2 be a diffraction order at which a highest diffraction efficiency is obtained when the second beam passes through the diffraction lens structure, the following condition is satisfied, and said polarization diffraction element selectively generates diffracted light when one beam passes therethrough

$$0.9 < |m1 \cdot \lambda 1| / |m2 \cdot \lambda 2| < 1.1 \quad \ldots(1)$$

5. The apparatus of claim 2, wherein

said apparatus includes a third laser source which emits a third beam having a wavelength $\lambda 3$ such that a polarization plane becomes substantially perpendicular to a polarization plane of the first beam or the second beam, and

letting $\lambda 1$ ($\lambda 1 < \lambda 3$) be a wavelength of the first beam, m1 be a diffraction order at which a highest diffraction efficiency is obtained when the first beam passes through the diffraction lens structure, $\lambda 2$ ($\lambda 1 < \lambda 2 < \lambda 3$) be a wavelength of the second beam, m2 be a diffraction order at which a highest diffraction efficiency is obtained when the second beam passes through the diffraction lens structure, and m3 be a diffraction order at which a highest diffraction efficiency is obtained when the third beam passes through the diffraction lens structure, the following condition is satisfied, and said polarization diffraction element selectively generates diffracted light when one beam or two beams pass therethrough

$$0.9 < |m1 \cdot \lambda 1| / |m2 \cdot \lambda 2| < 1.1 \quad \ldots(2)$$

$$|m3 \cdot \lambda 3| / |m1 \cdot \lambda 1| < 0.9 \text{ or}$$

$$|m3 \cdot \lambda 3| / |m1 \cdot \lambda 1| > 1.1 \quad \ldots(3)$$

6. The apparatus of claim 5, wherein said polarization diffraction element selectively diffracts the two beams having the aligned polarization planes, and diffraction efficiencies for the two wavelengths become

maximized at different diffraction orders.

7. The apparatus of claim 1, wherein said polarization diffraction element is driven integrally with said objective lens.

8. The apparatus of claim 1, wherein said polarization diffraction element is configured such that a birefringent medium and an isotropic medium are placed in contact with each other in an optical axis direction.

9. The apparatus of claim 8, wherein the birefringent medium has a cross-section which is taken along a plane perpendicular to a traveling direction of incident light and is formed concentrically, and a cross-section which is taken along a plane in a radial direction including the traveling direction of the incident light and is formed in a sawtooth shape.

10. An optical system for an optical pickup apparatus, comprising an objective lens including a refraction lens, which has a positive power, and a diffraction lens structure, which has a plurality of rings with fine stepped portions formed on at least one of lens surfaces of the refraction lens, and polarization diffraction element which selectively diffracts light depending on a polarization direction,

wherein incident light from a light source is made to pass through said polarization diffraction element and the diffraction lens structure and is focused by the refraction lens having positive power,

a diffraction order in the diffraction lens structure at which a highest diffraction efficiency is obtained with respect to a beam having a shorter wavelength of a plurality of wavelengths used for information recording or reproduction is different from a diffraction order at which a highest diffraction efficiency is obtained with respect to a beam having a longer wavelength, and

said polarization diffraction element generates diffracted light which exhibits a highest diffraction efficiency at a predetermined diffraction order other than 0 when at least a beam having one wavelength of the plurality of wavelengths is incident in a predetermined polarized state.

11. The optical system of claim 10, wherein said polarization diffraction element generates diffracted light with a diffraction efficiency of not less than 85% with respect to one of two incident light beams having orthogonal polarization planes.

12. The optical system of claim 10, wherein letting $\lambda 1$ be a wavelength of the first beam, m1 be a diffraction order at which a highest diffraction efficiency is obtained when the first beam passes through the diffraction lens structure, $\lambda 2$ ($\lambda 2 > \lambda 1$) be a wavelength of the second beam, and m2 be a diffraction order at which a highest diffraction efficiency is obtained when the second beam passes through the diffraction lens structure, the following condition is satisfied, and said polarization

diffraction element selectively generates diffracted light when one beam passes therethrough

$$0.9 < |m1 \cdot \lambda 1| / |m2 \cdot \lambda 2| < 1.1 \quad \ldots(1)$$

13. The optical system of claim 10, wherein

said optical system includes a third laser source which emits a third beam having a wavelength $\lambda 3$ such that a polarization plane becomes substantially perpendicular to a polarization plane of the first beam or the second beam, and

letting $\lambda 1$ ($\lambda 1 < \lambda 3$) be a wavelength of the first beam, m1 be a diffraction order at which a highest diffraction efficiency is obtained when the first beam passes through the diffraction lens structure, $\lambda 2$ ($\lambda 1 < \lambda 2 < \lambda 3$) be a wavelength of the second beam, m2 be a diffraction order at which a highest diffraction efficiency is obtained when the second beam passes through the diffraction lens structure, and m3 be a diffraction order at which a highest diffraction efficiency is obtained when the third beam passes through the diffraction lens structure, the following condition is satisfied, and said polarization diffraction element selectively generates diffracted light when one beam or two beams pass therethrough

$$0.9 < |m1 \cdot \lambda 1| / |m2 \cdot \lambda 2| < 1.1 \quad \ldots(2)$$

$$|m3 \cdot \lambda 3| / |m1 \cdot \lambda 1| < 0.9 \text{ or}$$

$$|m3 \cdot \lambda 3| / |m1 \cdot \lambda 1| > 1.1 \quad \ldots(3)$$

14. The optical system of claim 13, wherein said

polarization diffraction element selectively diffracts the two beams having the aligned polarization planes, and diffraction efficiencies for the two wavelengths become maximized at different diffraction orders.

15. The optical system of claim 10, wherein said polarization diffraction element is driven integrally with said objective lens.

16. The optical system of claim 10, wherein said polarization diffraction element is configured such that a birefringent medium and an isotropic medium are placed in tight contact with each other in an optical axis direction.

17. The optical system of claim 16, wherein the birefringent medium has a cross-section which is taken along a plane perpendicular to a traveling direction of incident light and is formed concentrically, and a cross-section which is taken along a plane in a radial direction including the traveling direction of the incident light and is formed in a sawtooth shape.